

DNAPL Remediation To Be Conducted at Pinellas STAR Center Northeast Site

The Northeast Site at the Pinellas Science, Technology, and Research (STAR) Center in Largo, Florida, is one of three designated solid-waste management units at the site that has groundwater contamination at levels in excess of regulatory standards in the surficial aquifer, which is not a source of drinking water.

Contaminants in the groundwater consist of common solvents used in previous U.S. Department of Energy (DOE) Pinellas Plant activities. Before 1968, the naturally swampy area west of the East Pond on the Northeast Site was used as a staging area for drums of waste solvents and construction debris. Investigations conducted in 1986 and 1987 of the groundwater in this area identified a potential contaminant groundwater plume of volatile organic compounds.

Administration of DOE environmental restoration activities at the Pinellas STAR Center is the responsibility of the DOE Grand Junction Office (GJO). DOE recommended that the Northeast Site undergo active remediation as part of the DOE Environmental Restoration Program at the site.

In 1991, DOE implemented an interim action that used monitor wells to recover the contaminated groundwater. The groundwater was then treated at the Pinellas STAR Center 4.5-Acre Site treatment facility. This interim action continued until late 1996 when a dedicated treatment system for the Northeast Site was installed. Organic compounds in the groundwater recovered at the Northeast Site are now volatilized in an on-site air stripper.

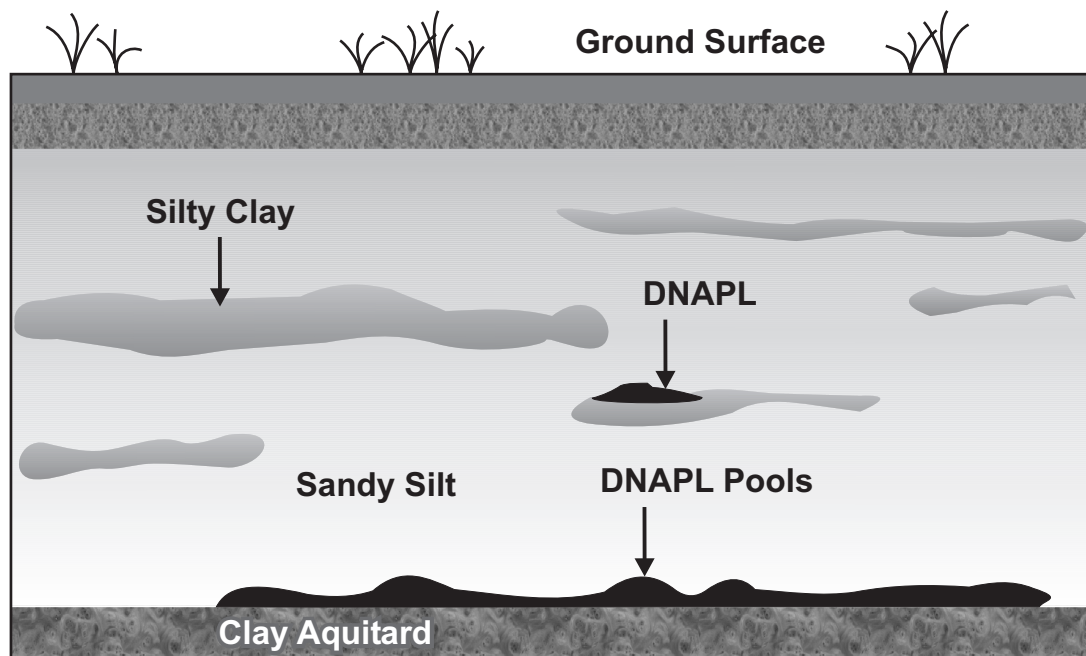
The potential presence of chlorinated organic solvents in the subsurface at the Northeast Site was first identified during routine quarterly sampling of monitor wells in July 1998. These organic solvents are denser than water and are called dense non-aqueous phase liquids (DNAPLs). Subsequent sampling and analyses confirmed the presence of DNAPLs in early 1999.

The DOE Grand Junction Office Technical Assistance and Remediation contractor, MACTEC Environmental Restoration Services, initiated additional characterization of the plume to better determine the horizontal and vertical extents of the contamination and to better quantify the concentrations of DNAPL contaminants present. This characterization effort was completed in June 2000. Results show DNAPL contamination levels up to 29,000 parts per million (ppm) in soils. Parts per million is a unit of concentration often used when measuring levels of pollutants in air, water, and body fluids. This concentration is 3,400 times the mandated maximum contaminant level in soils for the DNAPL compound. For comparison purposes, four drops of ink in a 55-gallon barrel of water would produce an ink concentration of 1 ppm. Therefore, 29,000 ppm would be equivalent to 116,000 drops of ink in the same barrel.

Recent sampling results indicate that the DNAPL contamination has migrated downward into the upper level of the Hawthorn Formation, which is the confining layer between the surficial aquifer (shallow groundwater) and the lower Floridan aquifer, from which local drinking water is obtained.

Concurrent with the field characterization efforts, an extensive search was conducted for potential remediation technologies that could be used to address the DNAPL contamination.





This artist's concept shows the possible locations of dense non-aqueous phase liquids (DNAPLs) in the subsurface. Sampling and laboratory analyses confirmed the presence of DNAPLs at the Northeast Site in early 1999.

This search included a review of current technical issues associated with DNAPL remediation, a literary search relative to DNAPL remediation, and discussions with various scientists involved in DNAPL research and vendors specializing in DNAPL remediation.

On the basis of the information gathered to date, a form of in situ thermal treatment appears to be the remediation technology with the greatest chance of success at the Northeast Site. In situ thermal technologies use various means of heating the surficial aquifer to the boiling point to mobilize DNAPL for extraction.

DNAPL remediation methods are emerging technologies that have been demonstrated in pilot scale but have a limited track record established for full-scale success. Therefore, the Request for Proposal (RFP) was developed with decision points, referred to as go/no-go gates, to minimize the DOE commitment of funds until success is demonstrated. An evaluation team will review the proposals and evaluate each proposal based on established criteria. Although cost is one of the criteria, the evaluation criteria are heavily weighted on the various technical aspects of the proposed technologies.

The RFP is tailored as a performance subcontract based on identified remediation goals. The subcontract will structure the subcontractor's activities into several subcontract options that can be exercised based on the successful execution of the predecessor activity. The first decision point will be the selection of a technology that the evaluation team rates highest against the evaluation criteria. A subcontract will not be awarded if, after reviewing the proposals, the team does not have a high level of confidence of achieving the cleanup goals with one of the proposed technologies.

The subcontract will initially be for design of the treatment system. The design will require DOE and Florida Department of Environmental Protection approval. If the design is not acceptable, the subcontract could be terminated at that point. If the design is approved, the first subcontract option could be exercised to deploy the treatment

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Training Collaboration Nets Cost Savings

Employees at two government entities and one private business in the Grand Junction, Colorado, area needed training on ion chromatographs for analyses of water samples. But the costly training classes were only available at a West Coast location and did not fit the employees' schedules.

The solution was to bring an instructor to Grand Junction at a cost savings of more than \$10,000. The collaborative effort by the U.S. Department of Energy Grand Junction Office (DOE-GJO), the City of Grand Junction, and Ute Water allowed employees to be trained in the use of this laboratory equipment about 1 month sooner than was possible at the West Coast training facility.

Five DOE-GJO contractor employees participated in the training conducted at the GJO site and in the GJO Environmental Sciences Laboratory. The training was particularly needed by employees working at the Uranium Mill Tailings Remedial Action Ground Water Project site at Tuba City, Arizona, to analyze sulfate, nitrate, and chloride anions in conjunction with operation of the water treatment plant at that location.

The 3-day course covered the theory of ion chromatography and included hands-on training on the instrument and hands-on training on the associated computer software. Eileen List coordinated the training for herself and other City of Grand Junction employees and for Ute Water participants; Dr. Stan Morrison made the training arrangements for five MACTEC Environmental Restoration Services employees at GJO.❖



Training on an ion chromatograph used to analyze water samples was conducted in the Environmental Sciences Laboratory at the DOE Grand Junction Office.

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system in Area A (0.5 acre). Approximately 3 acres of the Northeast Site has been identified in the RFP for treatment. Once the subcontractor demonstrates attainment of the remediation goals in Area A, an option could be exercised to treat Area B. If the goals are not achieved, the subcontract would be terminated, and further costs for treatment would cease.

This procurement strategy allows DOE to proceed with innovative technologies required for DNAPL remediation, while minimizing risk should the selected technology not achieve the remediation goals.

For more information about DNAPL remediation at the Northeast Site or the DOE Environmental Restoration Program at the Pinellas STAR Center, contact David Ingle, DOE-GJO Environmental Specialist, at (727) 541-8943.❖

DOE Bids Farewell to Long-Time Employee (continued from page 26)

really stretch a family budget by buying goods this way for pennies on the dollar," claims Young. He also collects antique automobiles, telephones, firearms, military equipment, and a type of glassware handed down from his family. His car collection includes four Model A Fords, two Mustangs, and a 1947 Willys Jeep. He estimates that he owns 30 to 35 antique phones ranging from 1905 to pre-1955 and an additional 20 modern phones.❖